REMARKS/ARGUMENTS

The Office communication of July 19, 2004 stated that the reply filed by Applicants on April 19, 2004 is not fully responsive to the December 22, 2003 Office Action because the claims are not in compliance with the Sequence Rules. Applicants have replaced the actual sequence recited in claims 1 and 8 with the corresponding SEQ ID NO and herein resubmit the reply filed on April 19, 2004 with this change.

The December 22, 2003 Office Action has rejected all claims under 35 U.S.C. § 112. Claims 1 – 8 are rejected under 35 U.S.C. § 102(b). The Office Action also disputes Applicants' claims for domestic priority.

In light of the amendments above and the arguments below, Applicants respectfully request reconsideration.

Priority

The Office Action has disputed Applicants' claim for domestic priority under 35 U.S.C. § 119(e). While not agreeing with the Examiner's characterization of the provisional application, Applicants note that the claims have now been narrowed to "eubacterial" species. Applicants believe that this satisfies the Examiner's concern in that regard. The Office Action notes that "further there is no conception of 'using the protein.'" Applicants have removed this language from all claims, but continue to assert that the provisional specification discloses use of the YggX. The provisional application does disclose the use of vector-based overexpression of the YggX gene or a gene encoding a homolog in a cell to provide resistance to superoxide damage.

Because of the claim amendments, Applicants believe this issue to be moot but welcome a phone call to the below-identified attorney to further discuss this matter.

35 U.S.C. § 112 Rejections

The Office Action rejects claims 1 – 8 under 35 U.S.C. § 112 as failing to comply with written description. On page of the Office Action, the Examiner proffers suggested language. Applicants have now drawn the claims to a eubacterial cells comprising vector-based expression of the YggX gene or a gene encoding a homolog of the YggX protein. Applicants continue to assert that their specification provides enablement for a gene encoding a YggX homolog. This is not a claim to only functional relationship but instead speaks directly to the structure of the protein. Note that the subject matter of claim 8, which includes an amino acid sequence motif described by Applicants as comprising a suitable homolog, is now incorporated into claim 1.

Claims 9 – 14 are rejected under 35 U.S.C. § 112 as failing to comply with the written description requirement. On page 8 of the Office Action, the Examiner has proffered some suggested language. Applicants have now amended claim 9 to comply with the Examiner's suggestion except for the inclusion of "homologs." Applicants continue to assert that the specification is adequately described and describe the use of homolog to the YggX protein. Note that Applicants have included the subject matter of claim 8, describing an amino acid sequence motif, into claim 9.

Claims 1 – 14 are rejected under 35 U.S.C. § 112, second paragraph. Claims 1 – 8 are rejected as indefinite in the use of the term "engineering the cell." Applicants have modified

that phrase. Claims 7 and 8 are rejected for the term "protein is used." Applicants have rewritten these claims.

Claim 2 is rejected as logically dependent from claim 1. Applicants have cancelled claim 2. Claims 1 – 14 are rejected on the basis of the recitation of "the YggX." Applicants have modified this language.

35 U.S.C. §§ 102/103 Rejections

Claims 1, 2, 3, 7 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gralnick, et al. Applicants note that Gralnick, et al. was disclosed in May, 2000, less than one year from the September 22, 2000 priority date of the above-identified application. Applicants have enclosed a Declaration attesting to the identity of the authors "J.A. Gralnick and D.M. Downs" as being the same as the Applicants of the above-identified application.

Claims 1 – 8 are rejected separately under 35 U.S.C. § 102(b) as being anticipated by Pianzzola, et al., Portnoy, et al., Ben-Amor, et al. and Kelner, et al. Applicants note that these references do not disclose Applicants' invention and have elected to treat them together.

Applicants have demonstrated that an increased level of YggX is NOT associated with increased levels of an activity that eliminates superoxides (i.e., superoxide dismutase or SOD). (See specification paragraph [0058], for example.) This is a critical difference between Applicants' work and the four papers that were published previously in different systems and were cited by the Examiner.

In Ben-Amor, et al. the mutant that was characterized showed phenotypes that were in many ways similar to what Applicants found for increased YggX expression. However, as noted succinctly in the abstract, this strain was overproducing catalase, superoxide dismutase

and peroxidase. Therefore the effect is one on gene regulation and not a direct detoxification of radical oxygen species.

Pianzzola, et al. describe a gene *rbo* from *Desulfovibrio* that was isolated in a screen for SOD activity *in vivo*. In other words, these authors isolated a plasmid carrying this gene for its ability to complement various defects associated with an *sod* mutant. The authors did no work with pure protein but the implication of the in vivo work was this protein has SOD activity.

The manuscripts by Portnoy, et al. and Kelner, et al. both deal with the protein ATX1, which is a copper metallochaperone. The Portnoy paper presents data that the purified protein reacts noncatalytically with superoxide *in vitro*. Again, the interpretations of the paper are succinctly put in the last part of the Abstract, where the suggestion is that the protein directly consumes superoxide. Finally, the Kelner report is somewhat similar, in that they use the Atox1 protein and a mutant derivative that is unable to bind Cu to show that expression of the wild-type protein increases the survival of neuronal cells to oxidative stress. These authors found the mutant lacking Cu binding was detrimental to survival and they suggest this to mean that a role for the protein in surviving oxidative stress it in trafficking Cu to the Cu/Zn SOD enzyme. Thus implicating the protein in an indirect role for resistance to oxidative stress. (See second to last paragraph in discussion.)

Applicants believe that they have distinguished the present invention from the Examiner's cited art. To further clarify the distinction, Applicants have added the phrase "and wherein there is no increased superoxide dismutate activity in the cells" to claim 1. Applicants believe that all claims are now in condition for allowance.

No fee is believed to be due in connection with this response. However, if any fees are necessary, please charge Deposit Account 17-0055.

Respectfully submitted,

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